

REMARKS

Claims 1, 3-47, 49-56, and 58-72 are pending.

Claim 2, 48, and 57 has been cancelled.

Claims 73-74 have been added.

In the Office Action dated September 30, 2009, claims 19, 41, 47, 52, 58, 59, and 62 were objected to; claims 19, 41, and 62 were provisionally rejected on the grounds of nonstatutory obviousness-type double patenting as unpatentable over copending application no. 10/676,922; claims 1, 3-60, and 62-72 were rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent No. 6,961,941 (Nelson); and claim 61 was rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 6,075,938 (Bugnion).

CLAIM OBJECTIONS

Claims 19, 41, 47, 52, 58, 59, and 62 have been amended to address the claim objections.  
Therefore, withdrawal of the claim objections is respectfully requested.

PROVISIONAL DOUBLE PATENTING REJECTION

Claims 19, 41, and 62 were provisionally rejected on the ground of non-statutory obviousness-type double patenting rejection over claims 17, 38, and 56 of copending application number 10/676,922 (hereinafter '922 application). The provisional obviousness-type double patenting rejection is premature at this point since none of the claims of the '922 application have yet issued.

Therefore, withdrawal of the provisional double patenting rejection is respectfully requested.

REJECTIONS UNDER 35 U.S.C. § 102

Un-amended independent claim 31 is clearly not anticipated by Nelson, contrary to the assertion by the Office Action. Claim 31 recites a computer comprising:

hardware, the hardware including memory, the memory encoded with an operating system, a virtual machine monitor, and code for interposing the virtual machine monitor between the operating system and the hardware at runtime, wherein the interposing occurs after booting of the computer,

wherein the operating system is to be booted in the computer before interposing the virtual machine monitor.

Note that according to claim 31, the memory is encoded with code for **interposing** the virtual machine monitor **between** the operating system and the hardware at runtime, where the interposing occurs after booting of the computer. The Office Action does not explain whether the Office Action is considering the console operating system (COS) of Nelson or the kernel of Nelson as constituting the “operating system” of claim 31. Note that the rejection of claim 31 refers to both the COS and the kernel. 09/30/2009 Office Action at 24-25. If the COS (420) shown in Fig. 1 of Nelson is considered the “operating system” of claim 1, then it is clear that the VMM 300 also shown in Fig. 1 of Nelson is not interposed between the COS 420 and the hardware. Instead, the VMM is provided between a virtual machine 200 and the kernel 600, as shown in Fig. 1 of Nelson. As emphasized by the Office Action, the VMM of Nelson is run on the kernel. 09/30/2009 Office Action at 25.

If the kernel 600 of Nelson is considered to be the “operating system” of claim 31, then that still doesn’t satisfy the requirement of the claim that the virtual machine monitor is interposed between the operating system and the hardware. In Fig. 1 of Nelson, it is apparent that the kernel is provided between the VMM 300 and the hardware 100.

There is no mapping of elements of Nelson that would satisfy the combination recited in claim 31. Therefore, it is clear that claim 31 is not anticipated by Nelson.

Independent claims 1 and 52 are similarly allowable over Nelson.

Independent claim 19 was also rejected as purportedly anticipated by Nelson. The rejection of claim 19 focuses on the teaching in Nelson that the kernel can be unloaded and removed from the computer. Nelson, 5:8-25. A further discussion of the unloading is provided in column 21 of Nelson. *Id.*, 21:20-31. However, although Nelson refers to unloading the kernel, there is no specific teaching in Nelson that the VMM of Nelson is also unloaded. Nelson

simply states that as a result of the unloading, the interrupt and fault handling is restored from the kernel to the first operating system (COS). *Id.*, 5:18-25; 21:28-32. Thus, the argument made by the Office Action that unloading of the kernel would cause the virtual machine monitor to be unloaded does not find support in the teachings of Nelson.

Therefore, claim 19 is not anticipated by Nelson.

Independent claims 41 and 62 are similarly allowable over Nelson.

Independent claim 61 was rejected as purportedly anticipated by Bugnion. Note that claim 61 recites an I/O driver having first and second modes of operation, where the I/O driver is operable in the first mode to interface directly between the operating system and the I/O device, and the I/O driver is operable in the second mode to interface between the operating system and the corresponding I/O driver of the virtual machine monitor.

The Office Action cited the following passages of Bugnion as purportedly disclosing the claimed subject matter: column 8, lines 27-29; column 9, lines 65-67; column 11, lines 48-51; column 17, lines 14-28. The cited column 11 passage of Bugnion refers to handling hardware interrupts directly by the VMM through its own device drivers. The cited column 17 passage of Bugnion refers to disco's monitor call interface for reducing the complexity and overhead of accessing I/O devices. The cited column 17 passage also notes that the monitor call interface provides a view of an idealized device, and the implementation of drivers is straight forward.

The cited column 8 passage refers to a multiprocessor that consists of a collection of nodes each containing a processor, main memory, and I/O devices. The cited column 9 passage of Bugnion refers to processors and physical memory, with operating systems assuming exclusive access to their I/O devices.

None of the passages of Bugnion provide any hint of an I/O driver that is operable in two modes of operation in the manner recited in claim 61. Therefore, claim 61 is clearly not anticipated by Bugnion.

Dependent claims, including newly added dependent claims 73 and 74, are allowable for at least the same reasons as corresponding independent claims.

Allowance of all claims is respectfully requested.

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The Commissioner is authorized to charge any additional fees and/or credit any overpayment to Deposit Account No. 08-2025 (200208633-1).

Respectfully submitted,

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